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Gambling Problem Severity and Psychiatric Disorders among Hispanic and White Adults: Findings from a Nationally Representative Sample¹

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Abstract

Objective—To examine differences in the associations of gambling problem severity and psychiatric disorders among a nationally representative sample of Hispanic and white adults.

Method—Chi-square tests and multinomial logistic regression analyses were performed on data obtained from the National Epidemiologic Survey on Alcohol and Related Conditions from 31,830 adult respondents (13% Hispanic; 87% white), who were categorized according to three levels of gambling problem severity (i.e., no gambling or low-frequency gambling [NG], low-risk or at-risk gambling [LRG], problem or pathological gambling [PPG]).

Results—Hispanic respondents in comparison to white respondents were more likely to exhibit PPG. Problem gambling severity was associated with past-year Axis I and lifetime Axis II psychiatric disorders in both Hispanic and white respondents, with the largest odds typically observed in association with the most severe gambling pathology. A stronger relationship between subsyndromal gambling and a broad range of Axis I disorders (mood, anxiety and substance use disorders) and Axis II disorders (particularly cluster B) was observed in Hispanic respondents as compared to white ones.

Conclusions—Levels of problem gambling severity are associated with the prevalence of Axis I and Axis II psychiatric disorders in both Hispanics and whites. Differences in the patterns of co-occurring disorders between subsyndromal levels of gambling in Hispanic and white respondents indicate the importance of considering ethnicity/race-related factors related to subthreshold levels of gambling in developing improved mental health prevention and treatment strategies.

Keywords

Gambling; mental disorders; comorbidity; ethnicity; race

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INTRODUCTION

Gambling and gambling problems are common among different ethnic and racial groups in the United States (Volberg, 2002; Westermeyer, Canive, Garrard, Thuras, & Thompson, 2005). Among public school students in Minnesota, Mexican Americans, as compared to whites, reported higher rates of weekly or daily gambling in 1992 (21.2% v. 14.0%) and 1995 (21.6% v. 12.3%), and higher rates of daily gambling in 1998 (9.5% v. 4.0%) (Stinchfield, 2000; Stinchfield, Cassuto, Winters, & Latimer, 1997). Investigations that have compared the prevalence of problem or pathological gambling among Hispanics and whites in the United States have yielded mixed findings. One study found that, in comparison to whites, Hispanics exhibited higher past-year rates of problem or pathological gambling (7.9% v. 1.8%) (Welte, Barnes, Wieczorek, Tidwell, & Parker, 2001), whereas a more recent study that examined ethnicity and race differences in lifetime prevalence rates of problem or pathological gambling from the National Epidemiologic Survey on Alcohol and Related Conditions data found similar rates for Hispanics (1.0%) and whites (1.2%) (Alegría et al., 2009).

Recent research on gambling and psychopathology has emphasized the importance of systematically examining the psychiatric morbidity that may accompany a continuum of problem gambling severity (such as recreational or low-risk gambling, at-risk gambling, problem gambling, and pathological gambling) among different population subgroups — a perspective that is consistent with a public health approach to the study of gambling (Barry, Steinberg, Wu, & Potenza, 2008; Desai & Potenza, 2008; Shaffer & Korn, 2002). This approach may be particularly relevant for minority populations in the United States. For example, we recently found that in comparison to white adults, black adults were more likely to exhibit past-year problem or pathological gambling and a stronger relationship between subsyndromal gambling (i.e., gambling-related behaviors and problems that do not meet threshold for pathological gambling) and any mood disorder, hypomania, and any substance use disorder (Barry, Stefanovics, Desai, & Potenza, in press). Additionally, assessing past-year, rather than lifetime, estimates of gambling and accompanying psychopathology may hold particular relevance. In comparison to lifetime measures, past-year measures are more likely to yield a better test of psychiatric comorbidity because symptoms of the disorders being considered will have been present within 12 months of each other, less likely to be subject to recall bias, and are arguably more important to clinicians and public health officials (Desai et al., 2008; Grant, Hasin, Chou, Stinson, & Dawson, 2004a). For these two reasons, we analyzed data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) study to examine the relationships between sociodemographic characteristics and psychiatric disorders accompanying varying levels of past-year gambling problem severity among Hispanic and white respondents. Given previous NESARC indicating a stronger relationship between subsyndromal levels of gambling and certain psychiatric disorders in black adults as compared to white ones (Barry et al., in press), we hypothesized that although rates of psychiatric disorders would be associated with past-year gambling problem severity in both Hispanic and white respondents, the relationship between subsyndromal gambling and psychopathology would be stronger in Hispanic respondents as compared to white ones.

METHODS

Sample

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) was conducted by the National Institute on Alcohol Abuse and Alcoholism and the US Census Bureau and sampled a nationally-representative group of US non-institutionalized residents (citizens and non-citizens) aged 18 and older (Grant et al., 2003a; Grant et al., 2004b). The

NESARC was designed to over-sample Hispanic and African American households, as well as individuals aged 18–24, to allow sufficient statistical power to investigate patterns of alcohol use in minority populations and young people. Multi-stage cluster sampling was used to identify respondents: census sampling units, households, and then household members were sequentially sampled. While individuals residing in jails, prisons, or hospitals were not included, the sample was augmented with members of group living environments, such as group homes, shelters, dormitories, and facilities for housing workers. Weights have been calculated to adjust standard errors for these over-samples, the cluster sampling strategy, and non-responses (Grant, Moore, Shepard, & Kaplan, 2003b).

The final NESARC sample consisted of 43,093 respondents with an overall response rate of 81 percent. For the purposes of the current study, we restricted the sample to 31,830 respondents, 7,402 of whom self-identified as Hispanic (12.54%) and 24,428 as white (87.46%) (percentages provided are weighted). Hispanic study participants did not endorse membership of any racial group, while white participants did not endorse Hispanic ethnicity membership. All participants provided written study consent. This study of publicly accessible, de-identified data from the NESARC was presented to the Yale Human Investigations Committee and exempted from review under federal regulation 45 CFR Part 46.101(b).

Measures

Sociodemographics—Participants provided information about their ethnicity or race (Hispanic, white), gender (male, female), marital status (married, previously married, never married), education (less than high school, high school graduate, some college, college or higher), employment (full time, part time, not working), age, and income.

Psychiatric Disorders—Trained lay interviewers collected specific DSM-IV Axis I and II psychiatric disorder data using the Alcohol Use Disorder and Associated Disability Interview Schedule-DSM-IV version (AUDADIS-IV) (American Psychiatric Association, 1994; Grant et al., 2003a). The AUDADIS-IV is a structured diagnostic interview with demonstrated test-retest reliability and has been found to be a useful tool for detecting psychiatric disorders in a community sample (Grant et al., 2003a). Not all Axis I or Axis II psychiatric disorders were assessed in the NESARC due to concerns about subject burden and time constraints (Grant et al., 2005). The following DSM-IV-related Axis I and II diagnostic variables (derived from AUDADIS-IV), which are available on the publicly accessible NESARC database (http://pubs.niaaa.nih.gov/publications/NESARC_DRM/NESARCDRM.htm), were used in this study and—consistent with prior research (Grant, Desai, & Potenza, 2009)—grouped as follows: mood disorder (major depression, dysthymia, mania, hypomania); anxiety disorder (panic disorder with or without agoraphobia, social phobia, simple phobia, generalized anxiety); substance use disorder (alcohol abuse/dependence, drug abuse/dependence, nicotine dependence); and personality disorder cluster A (paranoid, schizoid), cluster B (histrionic, antisocial), and cluster C (avoidant, dependent, obsessive-compulsive).

We used past-year Axis I diagnoses with general medical condition and substance use exclusions; thus, research diagnoses can be viewed as orthogonal or “primary” as per DSM-IV/DSM-IV-TR guidelines (American Psychiatric Association, 1994; Desai et al., 2008). Unlike Axis I psychiatric diagnoses, Axis II diagnostic criteria were not restricted to the past year. Instead, respondents were asked how they felt or acted most of the time, irrespective of the situation, throughout their lives.

Similar to previous research, respondents’ answers to the gambling-related items from the AUDADIS-IV were used to classify them into one of three gambling groups: a) “non-

gamblers or low-frequency gamblers” (i.e., those reporting that they had never gambled more than five times per year in their lifetime); b) “low-risk or at-risk gamblers” (i.e., those reporting gambling more than five times in a year but who exhibited 0 to 2 inclusionary criteria of pathological gambling in the previous year); and c) “problem or pathological gamblers” (i.e., those reporting 3 or more inclusionary criteria of pathological gambling in the previous year) (Desai et al., 2008). Respondents who indicated that they had gambled five or more times in at least 1 year of their life were asked about inclusionary criteria of DSM-IV pathological gambling. The AUDADIS-IV assessed the 10 DSM-IV diagnostic inclusionary criteria for pathological gambling (American Psychiatric Association, 1994). As previously done, problem gambling was operationally defined as meeting 3–4 DSM-IV inclusionary criteria for pathological gambling, and pathological gambling was operationally defined as meeting 5 or more gambling-related inclusionary criteria (American Psychiatric Association, 2000; Barry, Maciejewski, Desai, & Potenza, 2007; Desai et al., 2008). Respondents with problem or pathological gambling were grouped together in this study because of the low proportion of participants who met criteria for pathological gambling (less than 1% of the sample), a strategy that has been employed in previous gambling studies (Cunningham-Williams, Cottler, Compton, & Spitznagel, 1998; Desai et al., 2008; Grant et al., 2009; Slutske et al., 2000). Similarly, we grouped together low-risk or at-risk gamblers in order to have sufficient power to test hypotheses with less frequently acknowledged diagnoses, particularly among Hispanic respondents.

Data Analysis

The primary research questions concerned differences among Hispanic and white respondents in the association between past-year gambling problem severity and psychiatric disorders. To address these questions, data analyses proceeded in several steps. First, we examined using χ^2 the associations between gambling problem severity and socio-demographic characteristics (gender, marital status, education level, employment status, age, and income), stratified by ethnicity or race (Hispanic and white), in order to identify sociodemographic variables potentially influencing the relationship between race, gambling problem severity, and psychiatric disorders. Second, we examined unadjusted weighted rates of psychiatric disorders, stratified by both gambling problem severity and ethnicity or race. Third, we fit a series of multinomial logistic regression models with psychiatric variables as the dependent variable of interest and the 3-level gambling problem-severity variable (i.e., non-gambling or low-frequency gambling [NG], low-risk or at-risk gambling [LRG], problem or pathological gambling [PPG]), race/ethnicity (Hispanic, white), and the interaction between ethnicity or race and gambling problem severity as the independent variables of interest, adjusting for potentially confounding sociodemographic variables (i.e., age, gender, marital status, income, education, employment). Our analysis began with examining psychiatric disorders grouped into Axis I and II categories. If significant findings were observed, 3 categories within each Axis were examined to identify further the nature of the findings: any mood disorder, any anxiety disorder, and any substance use disorder for Axis I categories, and any Cluster A, any Cluster B, and any Cluster C for Axis II categories. When significant associations were found between these categories and gambling problem severity and race/ethnicity, we pursued further analysis of the individual disorders. The NG category was used as a reference level for two sets of adjusted odds ratios: LRG versus NG and PPG versus NG. Interaction term odds ratios tested whether the adjusted odds ratios for Hispanic respondents were significantly different from those for white respondents. Due to the complex design of the study sample and the goal of estimating as accurately as possible the national rates of co-occurring psychiatric disorders, analyses were performed using NESARC-calculated weights and SUDAAN software (Research Triangle Institute, 2001). Consequently, sample proportions are based on weighted percentages.

RESULTS

Forty eight percent of respondents were men ($n = 14,103$) and 52% were women ($n = 17,727$); 13% self-identified as Hispanic ($n = 7,402$) and 87 % as white ($n = 24,428$). Participants' ages ranged from 18 to 98 years old ($M = 46.9$, $SD = 18.4$). More than half (64% [$n = 17,675$]) of the sample was married, 17% ($n = 7,867$) was previously married, and 19% ($n = 6,288$) was never married.

While most participants had at least a high-school level of education (30% [$n = 9,191$] were high school graduates, 30% [$n = 9,390$] had some college education and 25% [$n = 7,780$] were college graduates), a minority (15%; [$n = 5,469$]) had never completed high school. Approximately one-half of respondents (53% [$n = 16,341$]) reported working full time, 11% ($n = 3,231$) were part time workers, and 36% ($n = 12,258$) did not have a job. The median annual household income was \$56,053 ($SE = \950).

Associations between gambling problem severity and sociodemographic characteristics were largely similar for Hispanic and white respondents (Table 1), with the exception of marital status: among Hispanics, gambling problem severity was not associated with marital status, while among whites, significant differences were observed, with the PPG group, as compared to the NG and LRG groups, least frequently acknowledging being married (50% vs. 64% vs. 67%, respectively).

Gambling Problem Severity

The majority ($N=23,316$; 72%) of Hispanic and white respondents reported either no gambling or low-frequency gambling (47% and 44% for Hispanic and white men, respectively, and 53% and 56% for Hispanic and white women, respectively) or "low-risk or at-risk" gambling (65% and 59% for Hispanic and white men, respectively, and 35% and 41% for Hispanic and white women, respectively). The prevalence rates of past-year problem or pathological gambling were higher ($p < .0001$) for white (0.5%) respondents in comparison to Hispanic (0.4%) respondents (0.6% and 0.4% for Hispanic and white men, respectively, and 0.3% and 0.2% for Hispanic and white women, respectively). Overall, 0.4% ($n=138$) of the sample, and 0.6% of men and 0.3% of women, reported problem or pathological gambling.

Psychiatric Disorders

Table 2 summarizes the patterns of associations observed between gambling problem severity and psychiatric morbidity among Hispanic and white respondents. Significant associations between gambling problem severity were observed for any Axis I and any Axis II disorder for both Hispanics and whites. Differences were suggested between Hispanic and white respondents within each contributing category in the Axis I (mood, anxiety, and substance use) and Axis II (clusters A, B, and C), with associations between mania, hypomania, social phobia, generalized anxiety disorder, and gambling problem severity significant at $p < .05$ among Hispanic but not among white respondents. Conversely, associations between major depression, simple phobia, drug abuse or dependence, schizoid personality disorder, and avoidant personality disorder and gambling problem severity were significant at $p < .05$ among white but not among Hispanic respondents.

Adjusted odds ratios from multivariate models investigating the strength of associations between psychiatric disorders and gambling problem severity groups are presented for Hispanic and white respondents, using the NG group for reference (Table 3). The odds of any Axis I or any Axis II disorder was elevated in association with LRG and PPG in both Hispanic and white respondents. However, interactions analyses yielded different relationships across Hispanics and white groups for subsyndromal levels of gambling

severity. A stronger relationship between LRG and any Axis I disorder (OR=1.30, $p=0.01$) and any Axis II disorder (OR=1.47, $p=0.001$) was observed in Hispanic participants as compared to white ones. Among the diagnostic groupings within each Axis (mood, anxiety, and substance use disorders for Axis I and clusters A, B, and C for Axis II), both Hispanic and white respondents generally demonstrated elevated odds in association with more severe levels of gambling. However, interaction analyses indicated important differences in the magnitude of the relationship between LRG and Axis I and Axis II disorder in Hispanic and white respondents. The relationships between LRG and any mood disorder (OR= 1.59, $p=0.003$), dysthymia (OR= 1.89, $p=0.03$), mania (OR= 2.13, $p=0.003$), any anxiety disorder (OR= 1.64, $p=0.0004$), panic disorder with or without agoraphobia (OR=1.96, $p=.01$), social phobia (OR=2.13, $p=0.005$), generalized anxiety disorder (OR=1.85, $p=0.01$), any substance use disorder (OR=1.27, $p=0.026$), paranoid personality disorder (OR=1.51, $p=0.03$), any cluster B (OR=1.96, $p=0.0004$), Histrionic personality disorder (OR=2.78, $p=0.0003$), antisocial personality disorder (OR=1.79, $p=0.009$), and avoidant personality disorder (OR=1.89, $p=0.03$) were stronger in Hispanics than in whites. Conversely, the relationship between LRG and nicotine dependence (OR= 0.71, $p=0.03$) was weaker in Hispanics than in whites. The relationships between PPG and psychiatric diagnoses were largely statistically similar in Hispanic and white respondents, with the exception of avoidant personality disorder for which a relatively stronger relationship between avoidant personality disorder and PPG was observed in Hispanic versus white respondents (OR= 4.00, $p=0.02$).

DISCUSSION

To our knowledge, this study is the first to systematically investigate differences between Hispanic and white adults in the associations between past-year Axis I and Axis II psychiatric disorders and different levels of gambling problem severity in a nationally representative sample. The findings support our main hypothesis. As hypothesized, the rates of psychiatric disorders were associated with past-year gambling problem severity in both Hispanic and white respondents, and the relationship between past-year gambling severity (specifically subsyndromal gambling) and several forms of psychopathology were stronger in Hispanic respondents as compared to white ones. Implications of the findings are discussed below.

Gambling Problem Severity

Our finding that white respondents exhibited higher rates of past-year problem or pathological gambling than their Hispanic counterparts differs from prior research findings documenting either equivalent lifetime frequencies among both groups (Alegría et al., 2009) or higher past-year rates for Hispanics in comparison to whites (Welte et al., 2001). The extent to which prevalence rate differences reported in the current and previous studies reflect different sample characteristics and time frame (past year vs. lifetime) is currently unclear and merits further investigation.

Whereas previous studies have found that racial minority women, in comparison to white women, may have an elevated risk for problem or pathological gambling (Barry et al., 2008; Westermeyer et al., 2005), we found that similar proportions of Hispanic and white problem or pathological gamblers were women. These data highlight that findings from one ethnic or racial group may not generalize to others and underscore the importance of investigating specific group individually.

Gambling Problem Severity and Axis I Psychiatric Disorders

Study findings corroborate those previously reported on the high rates of co-occurrence between problem or pathological gambling and Axis I psychiatric disorders among patients

in treatment or seeking help (Crockford & El-Guebaly, 1998; Shaffer et al., 2002). We found elevated rates of mood, anxiety, and substance use disorders among both Hispanic and white respondents with problem or pathological gambling. More than one half of problem or pathological gamblers, irrespective of ethnic or racial group membership, exhibited an Axis I disorder in the previous year. Study findings also extend those previously documented regarding the high rates of lifetime mood, anxiety, substance use disorders among Hispanic and white adults with problem or pathological gambling (Alegría et al., 2009) by specifying the types of past-year mood (major depression, mania, hypomania) and anxiety disorders (social phobia, simple phobia, generalized anxiety disorder) that were associated with problem or pathological gambling and by documenting the increasing prevalence of Axis I psychiatric disorders accompanying levels of gambling problem severity.

Study findings confirm and expand upon prior epidemiological studies, showing a robust association between problem or pathological gambling and a range of psychiatric disorders (Alegría et al., 2009; Cunningham-Williams et al., 1998; Petry, Stinson, & Grant, 2005). Whereas the Cunningham-Williams et al. study employed DSM-III diagnostic criteria in a sample recruited from St. Louis, MO, this study used DSM-IV diagnostic criteria in a nationally representative sample. In contrast to the Alegría et al. and Petry et al. studies that used lifetime measures of Axis I psychopathology, we incorporated past-year measures, which have been described as affording a better test of psychiatric comorbidity since symptoms and criteria of the psychiatric disorders being considered will have occurred within 12 months of each other, are less prone to recall bias, and are arguably more relevant to clinicians and public health officials (Desai et al., 2008; Grant et al., 2004a). The present study also extends prior NESARC studies (those examining differences in the relationship between gambling problem severity and other psychopathology as related to gender (Desai et al., 2008), alcoholism (Brewer, Potenza, & Desai, in press) or nicotine dependence (Grant et al., 2009)) by focusing on ethnic and racial differences in psychiatric disorders associated with gambling problem severity. Our findings offer support for the conceptualization that gambling problems occur along a continuum (Slutske et al., 2000; Toce-Gerstein, Gerstein, & Volberg, 2003). Similar to the ECA study (Cunningham-Williams et al., 1998), we found that the prevalence of Axis I psychiatric disorders increased with higher problem gambling severity, suggesting that clinicians might benefit from assessing and addressing the psychiatric correlates of subsyndromal gambling in addition to problem or pathological gambling.

While a largely similar pattern in the associations between gambling problem severity and Axis I disorders was observed in Hispanic and white respondents, a stronger relationship between subsyndromal levels of gambling and several psychiatric disorders was observed in Hispanic participants as compared to white ones. Specifically, the relationships between subsyndromal gambling and any Axis I disorder, any mood disorder, dysthymia, mania, any anxiety disorder, panic disorder with or without agoraphobia, social phobia, generalized anxiety disorder, and any substance use disorder were stronger in Hispanics than in whites. While prior research based on lifetime prevalence estimates of problem or pathological gambling (Alegría et al., 2009) concluded that Hispanics may benefit from the “Hispanic paradox” (i.e., more advantageous health outcomes among Hispanics as compared to whites despite poorer socioeconomic status and more health care access barriers (Scribner, 1996), our findings suggest this conclusion may be premature. While Hispanic respondents exhibited lower rates of past-year problem or pathological gambling than white ones, among those with subsyndromal levels of gambling, white respondents appeared protected more than Hispanic ones from Axis I psychiatric morbidity.

Among the general U.S. population, past-year prevalence estimates of psychiatric disorders indicate that Hispanics and whites exhibit similar rates of alcohol use disorders (7.9% vs.

8.9%, respectively), drug use disorders (1.7% vs. 1.9%, respectively), and personality disorders (14.0% vs. 14.6%, respectively) (Huang et al., 2006). However, in comparison to whites, Hispanics exhibit lower rates of mood disorders (8.0% vs. 9.4%, $p<.05$) and anxiety disorders (8.8% vs. 11.7%, $p<.05$) (Huang et al., 2006). Thus, it is striking that among our study participants with subsyndromal levels of gambling, Hispanics exhibited higher rates of anxiety, mood, and substance use disorders than did whites. Although these findings do not necessarily indicate that subsyndromal levels of gambling are pathological per se, they do point to an association between subsyndromal levels of gambling and psychopathology and suggest that further study examining gambling problem severity (specifically subsyndromal levels of gambling) and psychopathology is merited to define better the nature of the relationships and the clinical implications. For example, the extent to which subsyndromal levels of gambling may exacerbate mental health conditions in potentially vulnerable minority groups warrants direct investigation, as does the extent to which subsyndromal gambling may represent a response to mental health conditions. Longitudinal studies that investigate how gambling and psychiatric symptoms co-vary over time (e.g., how gambling behaviors might influence treatment outcome for psychiatric disorders) is needed and should be done in a culturally informed manner.

Potential mechanisms underlying the stronger relationship between subsyndromal levels of gambling and several psychiatric disorders among Hispanics in comparison to whites are currently unknown and merit further research attention. It is unclear, for example, whether Hispanic and white individuals who engage in subsyndromal levels of gambling differ in motivation for gambling (e.g., risk taking, sensation seeking, or escape), perceived benefits of gambling (e.g., recreation, anticipated financial payoff), or proportion of disposable income spent on gambling. Given that the prevalence rates of psychiatric disorders and mental health utilization differ significantly among different Hispanic subgroups (Alegria et al., 2007a; Alegria et al., 2007b) and that foreign-born Mexican Americans and whites exhibit significantly lower rates of mood, anxiety, and substance use disorders than do their U.S.-born counterparts (Burnam, Hough, Karno, Escobar, & Telles, 1987; Grant et al., 2004c; Vega et al., 1998), future studies that examine the psychiatric correlates of subsyndromal levels of gambling—in addition to the proposed mechanisms underlying these associations—among Hispanic and whites might benefit from a more systematic examination of demographic factors (e.g., native or foreign-born, length of residence in the U.S.) and cultural factors (e.g., acculturation, ethnic identity) among both Hispanics and whites. Currently, the association between cultural and demographic factors and gambling (e.g., gambling problem severity, preferred types of gambling) among Hispanics is not well understood and deserves further research attention (Cuadrado, 1999). For example, the extent to which factors such as neighborhood in which individuals live or congregate, gender, and income—independent of cultural factors such as acculturation and ethnic identity—are associated with gambling among minority populations is unclear and warrants further research investigation (See (Barry, Bernard, & Beitel, 2006; Barry et al., 2007)).

These findings expand upon prior research concerning the potential public health impact associated with subsyndromal levels of gambling (Shaffer, Hall, & Vander Bilt, 1999) by specifying groups of Axis I disorders that appear to be particularly associated with low-risk or at-risk gambling among Hispanics. Irrespective of the underlying mechanism for this association (e.g., cultural, socioeconomic), our findings suggest that public health initiatives targeting subsyndromal gambling for Hispanics may be warranted.

Gambling and Axis II Psychiatric Disorders

Community studies prior to the NESARC generally omitted measures of both gambling problem severity and personality disorders (PDs). Results from this study confirm and

expand upon prior studies demonstrating an association between PDs and with problem or pathological gambling (Alegría et al., 2009; Desai et al., 2008; Grant et al., 2009; Petry et al., 2005). PDs in general, specific clusters of PDs (cluster B), and individual PDs across clusters (paranoid personality disorder, any cluster B, Histrionic personality disorder, antisocial personality disorder, and avoidant personality disorder) demonstrated larger odd ratio magnitudes in association with subsyndromal gambling in Hispanics as compared to whites. Furthermore, the odds ratio for avoidant personality disorder and problem or pathological gambling was larger among Hispanic respondents in comparison to white ones. Overall, study findings suggest that clinicians should be alert to the possible presence of a personality disorder among Hispanic (and to a lesser extent white) patients with subsyndromal levels of gambling and not just among those presenting with problem or pathological gambling, especially since the presence of a PD may complicate the treatment for a gambling disorder (Blaszczynski & Steel, 1998).

Limitations and Strengths

Several potential limitations are worth noting. The cross-sectional design of the survey limits statements regarding causation among study variables. The low rates of past-year problem and pathological gambling necessitated their combination, and past-year low-risk and at-risk gambling were also combined to facilitate comparisons, particularly amongst Hispanic respondents. Consistent with prior investigations (Brewer et al., in press; Desai et al., 2008; Grant et al., 2009), we operationally defined past-year non-gamblers and low-frequency gamblers as those who had not gambled more than 5 times per year in their lifetime, and we set the threshold for problem or pathological gambling at 3 or more inclusionary criteria; however, these categorizations are not based on empirically derived thresholds. Towards this end, more research is needed to characterized data-defined thresholds for parsing groups of individuals with gambling problem symptomatology. Future research studies with sufficient statistical power might benefit from separating non-gamblers from low-frequency gamblers, low-risk gamblers from at-risk gamblers, and problem gamblers from pathological gamblers, and analyzing possible differences on psychiatric variables among these gambling subgroups. The NESARC did not exhaustively assess Axis I and Axis II disorders because of concerns about response burden. For example, of the ten DSM-IV personality disorder diagnoses, seven were assessed in the NESARC. One Cluster A (schizotypal) and two Cluster B (borderline and narcissistic) personality disorders were not assessed. Thus, discussion regarding Cluster A and Cluster B personality disorders in this manuscript is limited to those specific personality disorder diagnoses examined in the current study. Consequently, certain diagnoses of potential clinical relevance to gambling problem severity were not assessed, including non-gambling impulse control disorders, attention-deficit/hyperactivity disorder, and borderline personality disorder. Future research examining the psychiatric correlates of problem gambling severity might benefit from the inclusion of measures that assess these psychiatric diagnoses, including all Cluster A, B, and C personality disorders. The NESARC did not collect data on preferred forms of gambling among those with subsyndromal levels of gambling problem severity; thus, we were unable to compare Hispanic and white respondents from different gambling problem severity categorizations on preferred form of gambling, a potentially important feature of gambling problem severity. One prior study that examined NESARC respondents meeting criteria for DSM-IV pathological gambling found no differences between Hispanic and white respondents on types of gambling performed or gambling venues visited (Alegría et al., 2009).

Despite these limitations, the current study represents an important investigation of differences in the psychiatric comorbidity of problem gambling severity among Hispanics and whites. To our knowledge, this study is the first to systematically investigate differences

in psychiatric disorders accompanying varying levels of past-year gambling problem severity among a nationally-representative sample of Hispanic and white respondents. The strong associations across study groups between a variety of Axis I and Axis II disorders and gambling problem severity emphasizes the importance of the routine assessment of these psychiatric disorders in patients presenting for gambling treatment, as well as assessing and addressing problem gambling severity among patients seeking treatment for other psychiatric disorders. Study findings also highlight the increased prevalence of a variety of Axis I and II disorders among Hispanic subsyndromal gamblers in comparison to their white counterparts. The extent to which subsyndromal levels of gambling among vulnerable minority groups may exacerbate mental health conditions, or alternatively, represent a response to pre-existing psychiatric problems is currently unclear and warrants direct investigation. Furthermore, the potential mechanisms underlying the different psychiatric profiles accompanying subsyndromal gambling in Hispanics and whites (e.g., cultural) are unclear as is the extent to which these differences might influence help-seeking behaviors and treatment outcomes, particularly in non-gambling mental health domains, and both areas merit further investigation.

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Table 1
Sociodemographic characteristics of Hispanic and white respondents by gambling problem severity.

Characteristics	Hispanic Respondents				White Respondents			
	NG N=5,957	LRG N=1,417	PPG N=28	P	NG N=17,359	LRG N=6,959	PPG N=110	P
<i>Gender</i>								
Male	47.1	64.9	66.5	.0001	43.6	58.6	68.2	<.0001
Female	52.9	35.1	33.5		56.4	41.4	31.8	
<i>Marital status</i>								
Married	63.2	65.1	66.3	.076	63.7	66.8	49.8	<.0001
Previously married	12.1	14.6	17.4		17.6	18.1	22.9	
Never married	24.7	20.3	16.4		18.8	15.1	27.2	
<i>Education</i>								
Less than HS	41.0	30.4	19.2	.0069	11.5	10.8	15.9	<.0001
HS graduate	25.4	26.2	29.5		29.3	31.9	42.5	
Some college	22.5	28.5	42.7		30.5	32.9	28.1	
College or higher	11.1	15.0	8.6		28.7	24.4	13.4	
<i>Employment</i>								
Full time	55.9	65.1	80.2	.0028	51.4	55.8	55.5	.0003
Part time	9.9	7.7	6.5		11.2	9.9	13.0	
Not working	34.1	27.3	13.4		37.5	34.3	31.5	
<i>Age</i>	37.9	40.9	38.7	<.0001	46.4	48.3	41.7	<.0001
<i>Income</i>	20,113	45,689	37,724	.002	57,387	60,303	46,254	.0004

Note: NG = no gambling or low-frequency gambling group; LRG = low-risk or at-risk gambling group; PPG = problem or pathological gambling group. Ns represent actual number in each category; %s indicate weighted percentages.

Table 2

Prevalence of psychiatric diagnoses by gambling problem severity among Hispanic and white respondents.

Psychiatric Diagnoses	Hispanic Respondents				White Respondents			
	NG N=5,957	LRG N=1,417	PPG N=28	P	NG N=17,359	LRG N=6,959	PPG N=110	P
Any Axis I disorder	28.0	49.5	60.1	<.0001	40.2	56.7	82.9	<.0001
Any mood disorder	7.2	10.6	28.6	.013	9.5	9.8	24.3	.005
Major depression	5.4	6.5	20.6	.138	7.7	7.2	15.9	.035
Dysthymia	1.3	2.3	6.7	.086	1.9	1.9	5.1	.400
Mania	1.2	2.8	6.0	.037	1.6	1.9	7.3	.064
Hypomania	0.7	1.8	8.1	.036	1.1	1.4	2.8	.139
Any anxiety disorder	8.3	14.3	11.4	.0005	11.3	13.5	30.6	<.0001
Panic disorder w/ or w/o agoraphobia	1.5	2.8	6.7	.052	2.3	2.5	9.2	.137
Social phobia	1.7	3.7	7.7	.023	3.01	3.3	7.7	.116
Simple phobia	5.5	9.7	7.7	.290	7.1	9.1	21.1	<.0001
Generalized anxiety disorder	1.5	2.9	4.0	.034	2.1	2.4	8.9	.084
Any substance use disorder	21.9	43.9	53.6	<.0001	37.4	56.7	80.6	<.0001
Alcohol abuse/dependence	6.1	13.3	28.0	.0002	7.3	12.7	34.6	<.0001
Drug abuse/dependence	1.5	2.4	2.2	.367	1.7	2.8	6.0	.0002
Nicotine dependence	5.1	10.8	15.3	.0001	12.3	19.5	52.2	<.0001
Any Axis II disorder	12.2	22.1	60.3	<.0001	13.6	18.5	51.1	<.0001
Any Cluster A	6.5	9.7	37.2	.0093	5.2	6.6	24.9	<.0001
Paranoid	4.6	7.5	34.6	.008	3.6	4.4	23.2	.0004
Schizoid	3.4	4.7	18.7	.102	2.6	3.5	14.8	.001
Any Cluster B	3.4	9.7	27.8	.0002	4.3	6.9	25.8	<.0001
Histrionic	1.1	3.6	8.2	.001	1.7	2.0	14.0	.0048
Antisocial	2.5	7.1	19.6	.009	3.0	5.5	20.6	<.0001
Any Cluster C	6.8	10.7	29.3	.0024	9.2	11.8	27.9	<.0001
Avoidant	1.9	2.7	14.3	.112	2.6	2.2	8.7	.011
Dependent	0.4	0.5	3.5	.403	0.6	0.5	2.4	.330
Obsessive-compulsive	5.3	9.0	25.3	.002	7.7	10.4	25.6	<.0001

NG = no gambling/low-frequency gambling group; LRG = low-risk/at-risk gambling group; PPG = problem/pathological gambling group.

Table 3

Association between psychiatric diagnoses and gambling severity among Hispanic and white respondents.

Psychiatric Diagnoses	Hispanic respondents		White respondents		Interaction (Hispanic vs. white)	
	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG
Any Axis I disorder	2.51 ***	3.57 *	2.08 ***	6.89 ***	1.30(0.01) *	0.58(0.34)
Any mood disorder	1.94 ***	6.77 ***	1.15 *	2.59 ***	1.59(0.003) **	2.27(0.1)
Major depression	1.41	5.29 **	1.01	1.90 *	1.39(0.08)	2.78(0.07)
Dysthymia	2.13 **	7.11 **	1.14	2.43	1.89(0.03) *	2.86(0.23)
Mania	3.09 ***	6.30 *	1.47 **	4.12 **	2.13(0.017) *	1.54(0.61)
Hypomania	2.29 ***	13.47 **	1.62 **	2.02	1.82(0.05)	6.67(0.05)
Any anxiety disorder	2.34 ***	2.76	1.29 ***	3.26 ***	1.64(0.0004) ***	0.44(0.19)
Panic disorder w/ or w/o agoraphobia	2.37 ***	5.71 *	1.19	3.82 **	1.96(0.01) *	1.49(0.64)
Social phobia	2.47 ***	5.68 **	1.16	2.46 **	2.13(0.005) **	2.27(0.2)
Simple phobia	1.81 ***	1.56	1.38 ***	3.34 ***	1.32(0.12)	0.46(0.27)
Generalized anxiety disorder	2.24 **	2.96	1.21	4.00 **	1.85(0.01) *	0.74(0.75)
Any substance use disorder	2.72 ***	3.67 **	2.33 ***	6.74 ***	1.27(0.026) *	0.63(0.4)
Alcohol abuse/dependence	2.27 ***	6.81 ***	2.15 ***	6.21 ***	1.27(0.08)	1.09(0.89)
Drug abuse/dependence	2.11 *	1.75	2.23 ***	2.90 *	0.95(0.87)	0.60(0.58)
Nicotine dependence	1.94 ***	7.13 ***	1.94 ***	7.14 ***	0.71(0.03) *	1.85(0.3)
Any Axis II disorder	2.34 ***	12.03 ***	1.54 ***	6.13 ***	1.47(0.001) **	2.00(0.2)
Any Cluster A	1.86 ***	11.03 ***	1.41 ***	5.22 ***	0.77(1.13)	2.08(1.18)
Paranoid	2.09 ***	14.91 ***	1.38 ***	6.90 ***	1.51(0.03) *	2.17(0.19)
Schizoid	1.61 *	7.94 ***	1.48 ***	5.88 ***	1.09(0.72)	1.35(0.62)
Any Cluster B	3.36 ***	12.52 ***	1.90 ***	6.58 ***	1.96(0.0004) ***	2.22(0.17)
Histrionic	3.90 ***	8.78 **	1.40 **	8.06 ***	2.78(0.0003) ***	1.09(0.91)
Antisocial	3.76 ***	12.20 ***	2.13 ***	6.91 ***	1.79(0.009) **	1.75(0.41)
Any Cluster C	1.78 ***	6.02 ***	1.37 ***	3.59 ***	1.28(0.07)	1.64(0.36)

Psychiatric Diagnoses	Hispanic respondents		White respondents		Interaction (Hispanic vs. white)	
	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG	OR for LRG vs. NG	OR for PPG vs. NG
Avoidant	1.75 [*]	11.25 ^{***}	0.93	2.84 ^{**}	1.89(0.03) [*]	4.00(0.02) [*]
Dependent	1.75	16.56 ^{***}	1.02	3.33	1.70(0.41)	5.00(0.1)
Obsessive-compulsive	1.82 ^{***}	5.94 ^{***}	1.44 ^{***}	4.03 ^{***}	1.27(0.12)	1.47(0.48)

NG = no gambling/low-frequency gambling group; LRG = low-risk/at-risk gambling group; PPG = problem/pathological gambling group.

Adjusted for age, gender, marital status, income, education, and employment.

^{*} p<0.05,
^{**} p<0.01,
^{***} p<0.001.